

CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH

WALTER M. DICKIE, M.D., Director

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EDITOR

Sewage Disposal in Rural Districts

By CHESTER G. GILLESPIE, Chief, Bureau of Sanitary Engineering.

The demands of those living in the country, or even in their vacation places, for the same full line of plumbing as enjoyed in the city has created the problem of individual disposal of the resulting sewage. By sewage is meant not only the sludge but the watery effluent. There has thus grown up a rather specialized business of installing "farm" septic tanks combined with subsoil sewage disposal.

Every subsoil disposal system needs to be designed with two objectives, first to develop enough filtration above the ground water plane to prevent its pollution in the region of nearby wells, springs and streams; second to confine the effluent in a porous, well underdrained soil such that the water will not outcrop or ooze out upon the ground where children and pets can reach it. These considerations call for careful investigation and planning. It pays to get the work done by experienced, reliable men who have made a study of the subject. No hard and fast figures can be given for all parts of the layout.

One works blindly if he does not take into account the porosity and thickness of soil and subsoil layers, the depth to water table especially in winter, deductions on its possible current and direction, and relation of his proposed disposal to nearby wells.

Makeup of County Sewage Disposal for Waterflushed Waste.

For a quick glance, the main features are:

(a) A *root-tight sewer* from the house to the septic tank.

(b) A *septic tank* to extract the sludge and to deliver a water clear enough to be absorbed in the

soil. That is its only purpose. The effluent is potentially dangerous.

(c) An *underground or subsoil leaching and absorbing system for the sewage liquor*. This is the real important part of the layout.

Under such favorable circumstances as small family or vacation use, combined with a deep, loose soil and a ground water table 12 or 15 feet down, one may get along with a cesspool. Even a cesspool, however, absorbs sewage better if a septic tank is used ahead of it.

But under most conditions of soil, subsoil and ground water, the subsoil system is essentially a trench filter, of a length 20 to 100 feet per person, excavated to a flat grade in the deepest and loosest soil. In the bottom of the trench is a deep filter bed of rock or gravel with good pore space. On this bed lies an open joint tile for sewage distribution.

Where still tighter soils or impervious formations prevail beneath the trench, it is well to incorporate a cesspool beyond the ends of the trenches with a connection between the two from about the top of the tile. This device will tend to relieve occasional congestion. In especially difficult subsoil problems it is sometimes possible to relieve congestion from below by installing a drain tile 2 or 3 feet below the bottom of the subsoil system intermediate between the trench filter lines.

In the hardpan areas, such as occur up and down the San Joaquin and Sacramento valleys, there prevails a thin soil layer beneath which is hardpan of varying thickness. Beneath the hardpan it is common

to find additional loam or sand, often in the presence of the water table. In such cases it is well to blast through or bore through the hardpan layer here and there between the lines of the trench filler, to give the seepage a chance to filter beneath the hardpan. If the cesspools referred to are also used, special care must be taken to locate them remote from water wells.

Conditions Under Which a Subsoil System Will Not Work.

A few such difficult or impossible situations are:

(a) Soil of clay or adobe so impervious it will not soak up water. Observation of its behavior under rain conditions is useful. If rain water puddles will not soak away in an hour or so, the problem before us is bound to be expensive or impossible.

(b) Thin soil only 2 or 3 feet thick overlying an impervious layer; for example, hardpan too thick to be pierced, a conglomerate layer or a nonfissured bedrock.

(c) A location close to wells and at the same time a ground water plane within, say, 5 feet of the surface, in winter.

Character of Septic Tank Water.

Septic tank water is not pure, is not safe for drinking purposes, and is dangerous if admitted to a drinking water stream or into ground water drawn upon for drinking water. It is dangerous if used to irrigate vegetables, and especially vegetables eaten raw. It is dangerous to run it in open ditches to which chickens, pets, etc., may have access. Therefore it should be disposed of by allowing it to leach into the soil under cover and under ground, but as far above water table as possible.

Action of Septic Tanks.

Septic tanks are small setting tanks adapted for the removal of sludge from liquid sewage. Sludge deposits decrease the available space in a tank at the rate of about 3 cubic feet per person per year, and when in need of cleaning a good septic tank produces a poorly clarified water. One symptom of the condition is that the leaching system which formerly gave no trouble will no longer soak up the sewage. This indicates that either the tank needs cleaning or a new leaching system is needed, or both steps are necessary. Ordinarily tanks need cleaning in two to five years.

It is not necessary to inoculate septic tanks to make them work properly, though there is no harm in dumping a couple of buckets of well rotted stable manure in them.

Theoretically such substances as grease, oil, disinfectants, and brine prevent some reduction in the amount of solid matter in a septic tank, but as a

matter of simplicity all wastes are usually run through the septic tank together. In soils where disposal of effluent is a serious problem there may, however, be an advantage in constructing two septic tanks and separate leaching systems, one to receive the toilet wastes which are dangerous to health, and the other to receive the remaining wastes. One should then strive to make the toilet waste disposal system very successful.

Location of Septic Tank.

If properly constructed of concrete to avoid odors, the tank may and should be located as near the house as circumstances permit and in a position that will allow for carrying the sewage to the parcel of ground most likely to absorb the effluent without effecting wells, springs and important streams. It is also important to keep the sewer leading to the septic tank as close to the surface as practicable as this allows more leeway in solving the disposal problem, and also gains in the vertical height for sewage percolation, as previously discussed, to protect the ground water.

(For constructional details of septic tanks and leaching systems, write for Special Bulletin No. 47.)

“Still the world seems mounting higher,
Chasing unfulfilled desire,
Spurning barrier, prop and chain,
Scatt’ring darkness, conquering pain,
Winning much, but in each prize
Some sad germ of evil lies;
For the subtle taint that blends
With all human hopes and ends,
Making good the seed of ill,
Rules the course of nations still.”

—Lecky.

SEWAGE DISPOSAL PERMITS PENDING

The following applications for sewage disposal permits are pending before the State Board of Public Health, final action to be taken at the next meeting of the Board to be held in 337 State Building, San Francisco, October 19, 1929:

Carlsbad Sanitary District—Application for permit to construct a sewer system with separate sludge digestion plant, and discharge chlorination effluent into the Pacific Ocean through a 1000-foot outfall.

County of San Diego—Application for permit to construct an outfall sewer in the Mission Valley district, and to discharge settled and chlorinated sewage effluent into San Diego Bay.

Los Angeles County Sanitation District No. 2—Application for permit to dispose of the settled sewage of Districts Nos. 1, 2, 3, 5, and 8 into the Pacific Ocean 4000 feet off shore, just north of White Point.

THE APPROVAL OF CLINICAL LABORATORIES

The approval of laboratories by the State Board of Public Health, which is required by law for the official public health laboratories operated in conjunction with health departments, is extended to the clinical laboratories of the state on a voluntary basis.

The conditions for such approval and the procedure for obtaining it are as follows:

Application is made by the director on a form which calls for information regarding the education and experience of the director, the physical equipment of the laboratory and the type of work done. The applicant agrees to preserve, for a definite period, diagnostic slides, both positive and negative, to use official methods in the examination of milk and water, to keep an accurate record of daily work, to file reports with the State Laboratory when requested, and to examine and report on check specimens that may be submitted by the State Laboratory.

An inspection of the laboratory is then made and the director interviewed as to methods, personal qualifications, personnel, etc. Finally, the application, with data is referred to the State Board of Public Health for action.

One condition for approval is that the responsible workers in the laboratory shall possess the certificate of proficiency issued by the Department of Public Health on examination. Separate certificates are issued for each of the four divisions of the work—bacteriology, serology, parasitology and biochemistry.

A single individual may possess one or all of these certificates. A laboratory may be approved, with only one type of certificate, if no work is done excepting that which is covered by that certificate.

Certificates of approval that were issued before the requirement of a certified personnel came into operation (Resolution of the Board, November 12, 1927) will be continued until January 1, 1931, after which date all laboratories, to retain the certificate of approval, must have certified assistants. There must be at least one certificate of proficiency in the laboratory for each division of the work (bacteriology, serology, parasitology, biochemistry) that is performed in the laboratory.

Laboratory workers who do not have the certificate are classed as apprentices, and may work only under the direct supervision of the director of the laboratory or of a person possessing the certificate of proficiency.

Certificates of proficiency are issued in two grades, junior and senior. Those who make a passing grade in the examination, but do not give evidence of qualifications necessary for the responsibility of running a laboratory alone, will be given the junior grade certificate. Persons holding junior grade certificates may

be permitted to perform tests in the temporary absence of the director or of the person holding the senior grade certificate. Apprentices may not perform any tests in the absence of the director of the laboratory or of a person holding either the senior or junior certificate for the work in question.

Directors of laboratories are not required to personally hold the certificate of proficiency, so long as their personnel hold certificates, but before a laboratory can be approved its director must present satisfactory evidence of education and experience, in addition to the medical degree.

Laboratories, the directors of which do not devote their whole time to that particular laboratory, may be approved only when full time assistants possessing the senior certificates are employed.

A change in directors automatically cancels approval and the new director should return the old certificate and file a new application for approval.

The next examination for the certificate of proficiency, all divisions, will be held in Los Angeles and in Berkeley sometime in November, the exact date to be announced later.

Information regarding the scope of examinations, credits for education and experience, etc., and application forms will be mailed on request. Inquiries should be addressed to Dr. W. H. Kellogg, Chief State Bacteriological Laboratory, University of California, Berkeley.

KEEP DISH WATER HOT, SOAPY, TO KILL GERMS

Germs that enter the body through the mouth cause 92 per cent of the deaths from communicable diseases, statisticians have found. Figures like this point to the great importance of cleanliness in handling dishes and utensils. Bernard Behrend notes in an article in the October issue of *Hygeia*.

A temperature of 145° F. for a period of thirty minutes is necessary to kill most organisms of disease. Dish water is not usually hot enough to kill the germs in the short time used in washing dishes. In order to destroy the bacteria on dishes and silverware, disinfectant and liberal quantities of soap or soap powder in water as hot as the hand can endure. Dish water should be changed frequently and kept hot.

“All knowledge attains its ethical value and its human significance only by the human sense in which it is employed. Only a good man can be a great physician.”—*Nothnagel*.

“There is something in sickness that breaks down the pride of manhood.”—*Charles Dickens*.

MORBIDITY***Diphtheria.**

20 cases of diphtheria have been reported, as follows: Oakland 1, Los Angeles County 5, Inglewood 1, Long Beach 2, Los Angeles 4, Torrance 1, Merced County 1, Santa Ana 1, San Diego 1, San Francisco 2, Santa Cruz 1.

Scarlet Fever.

51 cases of scarlet fever have been reported, as follows: Alameda County 1, Albany 1, Berkeley 2, Oakland 7, Humboldt County 1, Los Angeles County 3, Glendale 1, Huntington Park 1, Long Beach 1, Los Angeles 6, Bell 1, Salinas 2, Orange County 2, Lincoln 3, San Francisco 10, Stockton 1, San Mateo 2, Santa Maria 1, San Jose 4, Sutter County 1.

Measles.

25 cases of measles have been reported, as follows: Oakland 6, Los Angeles 3, San Diego County 1, San Diego 1, San Francisco 12, Paso Robles 1, Porterville 1.

Smallpox.

20 cases of smallpox have been reported, as follows: Berkeley 1, Oakland 1, Eureka 1, Los Angeles 3, Pomona 1, Santa Ana 2, Corona 3, Riverside 1, San Luis Obispo County 6, Santa Clara County 1.

Typhoid Fever.

12 cases of typhoid fever have been reported, as follows: Contra Costa County 1, Los Angeles 2, Plumas County 1, Riverside County 1, Sacramento 1, San Francisco 4, Sutter County 1, California 1.**

Whooping Cough.

96 cases of whooping cough have been reported, as follows: Albany 1, Berkeley 8, Oakland 7, Los Angeles County 9, Glendale 1, Long Beach 2, Los Angeles 26, Pasadena 5, Bell 1, Merced County 2, Orange County 5, Placentia 3, Riverside 1, San Diego County 1, San Diego 8, San Francisco 10, Paso Robles 1, Santa Clara County 2, Palo Alto 2, San Jose 1.

Meningitis (Epidemic).

3 cases of epidemic meningitis have been reported, as follows: Sacramento 2, San Jose 1.

Leprosy.

Santa Clara County reported one case of leprosy.

Poliomyelitis.

6 cases of poliomyelitis have been reported, as follows: Los Angeles County 1, Los Angeles 2, Pasadena 1, San Diego 1, San Francisco 1.

Undulant Fever.

Stanislaus County reported one case of undulant fever.

Actinomycosis.

Glendale reported one case of actinomycosis.

Coccidioidal Granuloma.

Los Angeles reported one case of coccidioidal granuloma.

* From reports received September 16th and 17th, for week ending September 14th

** Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

COMMUNICABLE DISEASE REPORTS

Disease	1929				1928			
	Week ending			Reports for week ending Sept. 14 received by Sept. 17	Week ending			Reports for week ending Sept. 15 received by Sept. 18
	Aug. 24	Aug. 31	Sept. 7		Aug. 25	Sept. 1	Sept. 8	
Actinomycosis.....	1	0	0	1	1	0	0	0
Anthrax.....	0	0	0	0	0	2	0	0
Chickenpox.....	35	28	51	47	46	31	53	24
Coccidioidal Granuloma.....	1	0	1	1	0	1	1	0
Dengue.....	1	0	0	0	0	0	0	0
Diphtheria.....	36	37	29	20	46	45	49	34
Dysentery (Amoebic).....	6	3	2	0	2	2	3	1
Dysentery (Bacillary).....	2	7	4	0	0	1	2	3
Encephalitis (Epidemic).....	1	1	2	0	1	0	1	3
Erysipelas.....	7	12	3	5	14	7	8	7
Food Poisoning.....	4	13	0	0	3	0	0	16
German Measles.....	3	5	3	6	11	8	7	7
Gonococcus Infection.....	115	104	133	125	121	100	119	117
Influenza.....	9	8	6	11	7	7	30	9
Jaundice (Epidemic).....	0	1	0	0	0	0	0	0
Leprosy.....	0	0	0	1	1	2	0	0
Malaria.....	3	4	3	4	3	0	4	7
Measles.....	23	30	32	25	12	20	15	20
Meningitis (Epidemic).....	10	6	8	3	2	3	2	1
Mumps.....	95	104	77	106	36	45	60	58
Ophthalmia Neonatorum.....	1	0	1	0	2	0	0	0
Paratyphoid Fever.....	0	1	1	0	0	0	2	0
Pellagra.....	2	6	0	1	1	0	1	1
Plague.....	0	0	0	0	0	0	1	0
Pneumonia (Lobar).....	21	47	36	17	22	25	45	35
Poliomyelitis.....	11	7	4	6	8	6	7	6
Rabies (Animal).....	12	8	14	13	15	17	9	8
Scarlet Fever.....	68	64	70	51	50	34	42	61
Smallpox.....	22	24	13	20	12	7	18	13
Syphilis.....	163	180	121	161	154	157	159	111
Tetanus.....	1	2	2	2	2	3	3	4
Trachoma.....	3	0	1	3	1	2	2	2
Tularemia.....	2	1	0	0	0	1	6	6
Tuberculosis.....	144	234	191	134	212	148	230	169
Typhoid Fever.....	20	20	20	12	26	44	23	19
Typhus Fever.....	0	0	0	0	1	0	0	0
Undulant Fever.....	3	3	1	1	1	0	0	0
Whooping Cough.....	161	117	108	96	136	134	95	174
Totals.....	985	1,077	937	872	949	852	997	910

Smallpox is troublesome in some California communities. Diphtheria continues at a low level.

Mumps and whooping cough are the most prevalent of the common infectious diseases.

Epidemic meningitis has fallen to its lowest stage since last November.